REMARKS

Claims 1-3, 6-25, 27, and 37-39 are pending in the application. Claims 1, 16, 38, and 41 have been amended and claim 37 has been canceled, without prejudice. No new matter has been added by virtue of the amendments, support being found throughout the specification and claims.

35 U.S.C. § 103(a) Rejections

Judd, Berg, and Foo

Claims 1-3, 6, 7, 9, 12-22, 24, and 37-39 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,910,112 to Judd et al (hereinafter "Judd"), U.S. Patent No. 5,128,121 to Berg et al. (hereinafter "Berg"), and U.S. Patent Application No. 2002/0087067 to Foo (hereinafter "Foo"). Claims 8, 10-11, 23, 25, and 27 are rejected under 35 U.S.C. §103(a) over Judd, Berg, Foo, and U.S. Patent No. 5,492,814 to Weissleder (hereinafter "Weissleder"). Applicants respectfully traverse.

The Office acknowledges, on page 4 of the January 24, 2008 Office action, that Judd does not expressly teach the use of an iron oxide contrast agent so as to attenuate the ^{23}Na or ^{39}K MRI signal for ventricular cavity blood and viable well-perfused tissue.

Applicants note, in fact, that nowhere in Judd's method is the use of a contrast agent described or even suggested. Rather, Judd relies upon other techniques to improve its imaging methods. In particular, Judd increases voxel size, lengthens imaging time taking, employs fast imaging pulse sequences, uses GRE imaging, and varies the selection of receiver bandwidth to increase the overall MR signals for ^{23}Na and ^{39}K to a detectable level. (see e.g. col. 6, lines 10-11, 19-21, 57-59, and 66-67). Judd is not at all directed towards attenuating (reducing) the MRI signal for specific bodily fluids and tissues (e.g., ventricular cavity blood and well-perfused tissue). Applicants, thus, submit that there is absolutely no teaching or suggestion to use contrast agents in Judd's methods and, if so, why such contrast agents would even be used.

The Office asserts that Berg "teaches a method of improving the contrast in MRI images by using a ferromagnetic or paramagnetic contrast agent such as an iron oxide bound to a polysaccharide (C2, L26-35)" and that it would have been obvious to modify Judd to "include the use of iron oxide to attenuate the ^{23}Na or ^{39}K MRI signal for ventricular cavity blood and viable well-perfused tissue". Applicants respectfully disagree.

Berg describes the use of a combination of both positive and negative contrast agents to enhance tissue or organ visualization in MRI. Berg does not teach or suggest the use of the particular combinations of positive and negative contrast agents with ^{23}Na or ^{39}K MRI, in particular. Berg, further, does not teach or suggest the use of the particular combinations of positive and negative contrast agents while modifying parameters of ^{23}Na or ^{39}K MRI, how or why such factors can be modified (e.g. TE, T_{2s} and/or T_{2f}, or the amount of contrast agent administered), or whether such parameters can even be successfully modified.

As set forth in Applicants' disclosure, and as further indicated by Judd, ^{23}Na and ^{39}K MRI differ from each other. For example, modification of variables in each of these different types of imaging leads to different results. Still further, the introduction of contrast agents affects imaging by, e.g. affecting the spin reequilibration characteristics of the nuclei (see, e.g. Berg at col. 1, lines 10-14). Depending on the type of contrast agent introduced, the type of imaging being used, and the various factors, the resulting impact on the imaging will vary.

Thus, it is respectfully submitted that one cannot simply take one particular contrast agent (e.g. iron), particularly when Berg teaches the use of a combination of positive and negative contrast agents, and add it to Judd's method which is completely silent with respect to the use of contrast agents or how such agents can possibly impact the MRI results.

Applicants respectfully submit that improper hindsight reasoning has been used in selecting only certain features of Berg's overall described method, and adding these features to

Judd which uses completely different modification methods and which is completely silent with respect to contrast agents. Further, given the high level of unpredictability, it is respectfully submitted that one cannot simply pick and choose select teachings of one reference and implant these select teachings into another reference that is directed to the use of different factors to modify MRI.

The Office further acknowledges on page 5 of the January 24, 2008 Office action, that Judd, Berg, and Foo do not teach manipulating the contrast agent (now recited in independent claim 16). However, the Office asserts that Berg describes adjusting the contrasting agent components and using an effective amount so as to perform imaging to a particular contrast, pointing to col. 7, lines 12-46 and col. 8, lines 23-48). Applicants respectfully disagree.

The cited passages of Berg discuss how Berg's combination of positive and negative contrast agents are administered (col. 7, lines 12-46), and that preferred dosages will vary over a wide range depending on, e.g. administration route, nature of the subject, biodistribution, pharmacokinetics and chemical nature of the agents, magnetic field strength, and pulse sequence (col. 8, lines 23-48). Nowhere, however, does Berg teach or suggest manipulating the amount of contrast agent to reduce T_{2s} and/or T_{2f} values such that the signal from ventricular cavity blood and viable well-perfused tissue is reduced nor does Berg teach or suggest that the contrast agent can be successfully manipulated as taught by Applicants. This teaching comes purely from Applicants' present disclosure. Applicants respectfully disagree with the Office's proposed modifications and combination of Judd, Berg, and Foo and submit that this proposal uses impermissible hindsight reasoning.

The Office further acknowledges on page 5 of the January 24, 2008 Office action, that Judd, Berg, and Foo do not teach manipulating TE time to specifically reduce ^{23}Na and ^{39}K MRI signals (as now recited in independent claim 1). However, the Office asserts that Judd describes

manipulating TE. Applicants respectfully disagree with this proposed combination and modification of the references.

As set forth above, Judd uses different imaging methods to achieve different results. In particular, Judd increases voxel size, lengthens imaging time taking, employs fast imaging pulse sequences, uses GRE imaging, and varies the selection of receiver bandwidth to increase the overall MR signals for ^{23}Na and ^{39}K to a detectable level. (see e.g. col. 6, lines 10-11, 19-21, 57-59, and 66-67). Judd is not at all directed towards attenuating (reducing) the MRI signal for specific bodily fluids and tissues (e.g., ventricular cavity blood and well-perfused tissue). Further, Judd's methods are completely silent as to the use of contrast agents. Applicants respectfully submit that there is no teaching or suggestion to combine and modify Judd, Berg, and Foo as proposed or that such a combination and modification would even be successful. Rather, the Office has relied upon improper hindsight reasoning.

Weissleder does not remedy these deficiencies in Judd, Berg, and Foo. Weissleder is cited for the use of specific types of iron oxide contrast agents. However, Weissleder at least does not teach or suggest, for example, manipulating the contrast agent or TE as recited in Applicants' claims.

Thus, it is respectfully submitted that claims 1 and 16 are patentable over Judd, Berg, Fee, and Weissleder. Claims 2-3, 6, 7, 9, 12-15, 17-22, 24, and 37-39 depend from claims 1 and 16 and, thus, also are patentable over Judd, Berg, Fee, and Weissleder. Reconsideration and withdrawal of the rejections is respectfully requested.

CONCLUSION

It is believed the application is in condition for immediate allowance, which action is earnestly solicited.

Respectfully submitted,

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